

WHAT IS CLAIMED IS:

1. An isolated nucleic acid molecule having at least about 80% nucleic acid sequence identity to (a) a DNA molecule encoding a CHEPO polypeptide comprising the sequence of amino acid residues from about 1 or about 28 to about 193 of Figure 2 (SEQ ID NO:2), or (b) the complement of the DNA molecule of (a).
2. The isolated nucleic acid molecule of Claim 1 comprising nucleotides 1 or about 82 to about 579 of Figure 2 (SEQ ID NO:3).
3. The isolated nucleic acid molecule of Claim 1 comprising the nucleotide sequence of Figure 2 (SEQ ID NO:3).
4. The isolated nucleic acid molecule of Claim 1 comprising a nucleotide sequence that encodes the sequence of amino acid residues from about 1 or about 28 to about 193 of Figure 2 (SEQ ID NO:2).
5. An isolated nucleic acid molecule encoding a CHEPO polypeptide comprising DNA that hybridizes to the complement of the nucleic acid sequence that encodes amino acids 1 or about 28 to about 193 of Figure 2 (SEQ ID NO:2).
6. The isolated nucleic acid molecule of Claim 5, wherein the nucleic acid that encodes amino acids 1 or about 28 to about 193 of Figure 2 (SEQ ID NO:2) comprises nucleotides 1 or about 82 to about 579 of Figure 2 (SEQ ID NO:3).
7. The isolated nucleic acid molecule of Claim 5, wherein the hybridization occurs under stringent hybridization and wash conditions.
8. An isolated nucleic acid molecule comprising (a) DNA encoding a polypeptide scoring at least 80% positives when compared to the sequence of amino acid residues of from 1 or about 28 to about 193 of Figure 2 (SEQ ID NO:2), or (b) the complement of the DNA of (a).
9. A vector comprising the nucleic acid molecule of Claim 1.
10. The vector of Claim 9, wherein said nucleic acid molecule is operably linked to control sequences recognized by a host cell transformed with the vector.
11. A host cell comprising the vector of Claim 9.
12. The host cell of Claim 11, wherein said cell is a CHO cell.

13. The host cell of Claim 11, wherein said cell is an *E. coli*.

14. The host cell of Claim 11, wherein said cell is a yeast cell.

15. A process for producing a CHEPO polypeptide comprising culturing the host cell of Claim 11 under conditions suitable for expression of said CHEPO polypeptide and recovering said CHEPO polypeptide from the cell culture.

16. An isolated CHEPO polypeptide comprising an amino acid sequence comprising at least about 80% sequence identity to the sequence of amino acid residues from about 1 or about 28 to about 193 of Figure 2 (SEQ ID NO:2).

17. The isolated CHEPO polypeptide of Claim 16 comprising amino acid residues 1 or about 28 to about 193 of Figure 2 (SEQ ID NO:2).

18. An isolated CHEPO polypeptide scoring at least 80% positives when compared to the sequence of amino acid residues from 1 or about 28 to about 193 of Figure 2 (SEQ ID NO:2).

19. An isolated CHEPO polypeptide comprising the sequence of amino acid residues from 1 or about 28 to about 193 of Figure 2 (SEQ ID NO:2), or a fragment thereof sufficient to provide a binding site for an anti-CHEPO antibody.

20. An isolated polypeptide produced by (i) hybridizing a test DNA molecule under stringent conditions with (a) a DNA molecule encoding a CHEPO polypeptide comprising the sequence of amino acid residues from 1 or about 28 to about 193 of Figure 2 (SEQ ID NO:2), or (b) the complement of the DNA molecule of (a), (ii) culturing a host cell comprising said test DNA molecule under conditions suitable for the expression of said polypeptide, and (iii) recovering said polypeptide from the cell culture.

21. The isolated polypeptide of Claim 20, wherein said test DNA has at least about 80% sequence identity to (a) or (b).

22. A chimeric molecule comprising a CHEPO polypeptide fused to a heterologous amino acid sequence.

23. The chimeric molecule of Claim 22, wherein said heterologous amino acid sequence is an epitope tag sequence.

24. The chimeric molecule of Claim 22, wherein said heterologous amino acid sequence is a Fc region of an immunoglobulin.

25. An antibody which specifically binds to a CHEPO polypeptide.

26. The antibody of Claim 24, wherein said antibody is a monoclonal antibody.

27. The antibody of Claim 24, wherein said antibody is a humanized antibody.

28. An agonist to a CHEPO polypeptide.

29. An antagonist to a CHEPO polypeptide.

30. A composition of matter comprising (a) a CHEPO polypeptide, (b) an agonist to a CHEPO polypeptide, (c) an antagonist to a CHEPO polypeptide, or (d) an anti-CHEPO antibody in admixture with a pharmaceutically acceptable carrier.

31. A method of inducing erythropoiesis in a mammal, said method comprising administering to said mammal an effective amount of a CHEPO polypeptide or an agonist thereto, wherein erythropoiesis in said mammal is induced.

32. A method of inhibiting erythropoiesis in a mammal, said method comprising administering to said mammal an effective amount of an antagonist to a CHEPO polypeptide, wherein erythropoiesis in said mammal is inhibited.

33. The method according to Claim 31, wherein said antagonist is an anti-CHEPO antibody.

34. A CHEPO polypeptide comprising an amino acid sequence selected from the group consisting of:

- (1) APPRLICDSRVLERYLLEAKEAEENITGCAEHCSLNENITVPDTKVNIFYAWKRNXXSQQAVEVW
QGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKAVSGLRSLTLLRALGAQKEAISPPDAASAA
PLRTITADTFRKLFRVYSNFLRGKCLKLYTGACRTGDR (SEQ ID NO:18);
- (2) APPRLICDSRVLERYLLEAKEAEENITGCAEHCSLNENITVPDTKVNIFYAWKRNXXSQQAVEVW
QGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKAVSGLRSLTLLRALGAKKEAISPPDAASAA
PLRTITADTFRKLFRVYSNFLRGKCLKLYTGACRTGDR (SEQ ID NO:19);

- (3) APPRLICDSRVLERYLLEAKEAEENITTGCAEHCSLNENITVPDTKVNIFYAWKRNXTXQQAWEVW
QGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKAVSGLRSLTLLRALGAQKEAISPPDAASAA
PLRTITADTFRKLFRVYSNFLRGKCLKYTGEACRTGDR (SEQ ID NO:20);
- (4) APPRLICDSRVLERYLLEAKEAEENITTGCAEHCSLNENITVPDTKVNIFYAWKRNXTXQQAWEVW
QGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKAVSGLRSLTLLRALGAKKEAISPPDAASAA
PLRTITADTFRKLFRVYSNFLRGKCLKYTGEACRTGDR (SEQ ID NO:21);
- (5) APPRLICDSRVLERYLLEAKEAEENITTGCAEHCSLNENITVPDTKVNIFYAWKRMNXSXQAVEV
WQGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKAVSGLRSLTLLRALGAQKEAISPPDAASA
APLRTITADTFRKLFRVYSNFLRGKCLKYTGEACRTGDR (SEQ ID NO:22);
- (6) APPRLICDSRVLERYLLEAKEAEENITTGCAEHCSLNENITVPDTKVNIFYAWKRMNXSXQAVEV
WQGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKAVSGLRSLTLLRALGAKKEAISPPDAASA
APLRTITADTFRKLFRVYSNFLRGKCLKYTGEACRTGDR (SEQ ID NO:23);
- (7) APPRLICDSRVLERYLLEAKEAEENITTGCAEHCSLNENITVPDTKVNIFYAWKRMNXXTXQAVEV
WQGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKAVSGLRSLTLLRALGAQKEAISPPDAASA
APLRTITADTFRKLFRVYSNFLRGKCLKYTGEACRTGDR (SEQ ID NO:24);
- (8) APPRLICDSRVLERYLLEAKEAEENITTGCAEHCSLNENITVPDTKVNIFYAWKRMNXXTXQAVEV
WQGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKAVSGLRSLTLLRALGAKKEAISPPDAASA
APLRTITADTFRKLFRVYSNFLRGKCLKYTGEACRTGDR (SEQ ID NO:25);
- (9) APPRLICDSRVLERYLLEAKEAEENITTGCAEHCSLNENITVPDTKVNIFYAWKRMENXSXAVEVW
QGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKAVSGLRSLTLLRALGAQKEAISPPDAASAA
PLRTITADTFRKLFRVYSNFLRGKCLKYTGEACRTGDR (SEQ ID NO:26);
- (10) APPRLICDSRVLERYLLEAKEAEENITTGCAEHCSLNENITVPDTKVNIFYAWKRMENXSXAVEVW
QGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKAVSGLRSLTLLRALGAKKEAISPPDAASAA
PLRTITADTFRKLFRVYSNFLRGKCLKYTGEACRTGDR (SEQ ID NO:27);
- (11) APPRLICDSRVLERYLLEAKEAEENITTGCAEHCSLNENITVPDTKVNIFYAWKRMENXTXAVEVW
QGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKAVSGLRSLTLLRALGAQKEAISPPDAASAA
PLRTITADTFRKLFRVYSNFLRGKCLKYTGEACRTGDR (SEQ ID NO:28);
- (12) APPRLICDSRVLERYLLEAKEAEENITTGCAEHCSLNENITVPDTKVNIFYAWKRMENXTXAVEVW
QGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKAVSGLRSLTLLRALGAKKEAISPPDAASAA
PLRTITADTFRKLFRVYSNFLRGKCLKYTGEACRTGDR (SEQ ID NO:29);
- (13) APPRLICDSRVLERYLLEAKEAEENITTGCAEHCSLNENITVPDTKVNIFYAWKRMEVNXSXVEVW
QGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKAVSGLRSLTLLRALGAQKEAISPPDAASAA
PLRTITADTFRKLFRVYSNFLRGKCLKYTGEACRTGDR (SEQ ID NO:30);
- (14) APPRLICDSRVLERYLLEAKEAEENITTGCAEHCSLNENITVPDTKVNIFYAWKRMEVNXSXVEVW
QGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKAVSGLRSLTLLRALGAKKEAISPPDAASAA
PLRTITADTFRKLFRVYSNFLRGKCLKYTGEACRTGDR (SEQ ID NO:31);

- (15) APPRLICDSRVLERYLLEAKEAEENITTGCAEHCSLNENITVPDTKVNIFYAWKRMEVNXTXVEVW
QGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKAVSGLRSLTTLRALGAQKEAISPPDAASAA
PLRTITADTFRKLFRVYSNFLRGKCLKLYTGEACRTGDR (SEQ ID NO:32); and
- (16) APPRLICDSRVLERYLLEAKEAEENITTGCAEHCSLNENITVPDTKVNIFYAWKRMEVNXTXVEVW
QGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKAVSGLRSLTTLRALGAKKEAISPPDAASAA
PLRTITADTFRKLFRVYSNFLRGKCLKLYTGEACRTGDR (SEQ ID NO:33), wherein X is any
amino acid except for proline.

35. The CHEPO polypeptide according to Claim 34, which comprises an amino acid sequence
selected from the group consisting of:

- (1) MGVHECPAWLWLLSLLSLPLGLPVLGAPPRLICDSRVLERYLLEAKEAEENITTGCAEHCSLNE
NITVPDTKVNIFYAWKRNXSXQQA VE V W QGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKAV
SGLRSLTTLRALGAQKEAISPPDAASAA PLRTITADTFRKLFRVYSNFLRGKCLKLYTGEACRTG
DR (SEQ ID NO:34);
- (2) MGVHECPAWLWLLSLLSLPLGLPVLGAPPRLICDSRVLERYLLEAKEAEENITTGCAEHCSLNE
NITVPDTKVNIFYAWKRNXSXQQA VE V W QGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKAV
SGLRSLTTLRALGAKKEAISPPDAASAA PLRTITADTFRKLFRVYSNFLRGKCLKLYTGEACRTG
DR (SEQ ID NO:35);
- (3) MGVHECPAWLWLLSLLSLPLGLPVLGAPPRLICDSRVLERYLLEAKEAEENITTGCAEHCSLNE
NITVPDTKVNIFYAWKRNTXQQA VE V W QGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKAV
SGLRSLTTLRALGAQKEAISPPDAASAA PLRTITADTFRKLFRVYSNFLRGKCLKLYTGEACRTG
DR (SEQ ID NO:36);
- (4) MGVHECPAWLWLLSLLSLPLGLPVLGAPPRLICDSRVLERYLLEAKEAEENITTGCAEHCSLNE
NITVPDTKVNIFYAWKRNTXQQA VE V W QGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKAV
SGLRSLTTLRALGAKKEAISPPDAASAA PLRTITADTFRKLFRVYSNFLRGKCLKLYTGEACRTG
DR (SEQ ID NO:37);
- (5) MGVHECPAWLWLLSLLSLPLGLPVLGAPPRLICDSRVLERYLLEAKEAEENITTGCAEHCSLNE
NITVPDTKVNIFYAWKRMNXSXQQA VE V W QGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKA
V SGLRSLTTLRALGAQKEAISPPDAASAA PLRTITADTFRKLFRVYSNFLRGKCLKLYTGEACRT
GDR (SEQ ID NO:38);
- (6) MGVHECPAWLWLLSLLSLPLGLPVLGAPPRLICDSRVLERYLLEAKEAEENITTGCAEHCSLNE
NITVPDTKVNIFYAWKRMNXSXQQA VE V W QGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKA
V SGLRSLTTLRALGAKKEAISPPDAASAA PLRTITADTFRKLFRVYSNFLRGKCLKLYTGEACRT
GDR (SEQ ID NO:39);
- (7) MGVHECPAWLWLLSLLSLPLGLPVLGAPPRLICDSRVLERYLLEAKEAEENITTGCAEHCSLNE
NITVPDTKVNIFYAWKRMNXTXQQA VE V W QGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKA

- VSGLRSLTLLRALGAQKEAISPPDAASAAPLRTITADTFRKLFRVYSNFLRGKCLKLYTGEACRT
GDR (SEQ ID NO:40);
- (8) MGVEHECPAWLWLLSLLSLPLGLPVLGAPPRLICDSRVLERYLLEAKEAENITTGCAEHCSLNE
NITVPDTKVNIFYAWKRMNXTXQAVEVWQGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKA
VSGLRSLTLLRALGAKKEAISPPDAASAAPLRTITADTFRKLFRVYSNFLRGKCLKLYTGEACRT
GDR (SEQ ID NO:41);
- (9) MGVEHECPAWLWLLSLLSLPLGLPVLGAPPRLICDSRVLERYLLEAKEAENITTGCAEHCSLNE
NITVPDTKVNIFYAWKRMENXSXAVEVWQGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKAV
SGLRSLTLLRALGAQKEAISPPDAASAAPLRTITADTFRKLFRVYSNFLRGKCLKLYTGEACRTG
DR (SEQ ID NO:42);
- (10) MGVEHECPAWLWLLSLLSLPLGLPVLGAPPRLICDSRVLERYLLEAKEAENITTGCAEHCSLNE
NITVPDTKVNIFYAWKRMENXSXAVEVWQGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKAV
SGLRSLTLLRALGAKKEAISPPDAASAAPLRTITADTFRKLFRVYSNFLRGKCLKLYTGEACRTG
DR (SEQ ID NO:43);
- (11) MGVEHECPAWLWLLSLLSLPLGLPVLGAPPRLICDSRVLERYLLEAKEAENITTGCAEHCSLNE
NITVPDTKVNIFYAWKRMENXTXAVEVWQGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKA
VSGLRSLTLLRALGAQKEAISPPDAASAAPLRTITADTFRKLFRVYSNFLRGKCLKLYTGEACRT
GDR (SEQ ID NO:44);
- (12) MGVEHECPAWLWLLSLLSLPLGLPVLGAPPRLICDSRVLERYLLEAKEAENITTGCAEHCSLNE
NITVPDTKVNIFYAWKRMENXTXAVEVWQGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKA
VSGLRSLTLLRALGAKKEAISPPDAASAAPLRTITADTFRKLFRVYSNFLRGKCLKLYTGEACRT
GDR (SEQ ID NO:45);
- (13) MGVEHECPAWLWLLSLLSLPLGLPVLGAPPRLICDSRVLERYLLEAKEAENITTGCAEHCSLNE
NITVPDTKVNIFYAWKRMEVNXSXVEVWQGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKAV
SGLRSLTLLRALGAQKEAISPPDAASAAPLRTITADTFRKLFRVYSNFLRGKCLKLYTGEACRTG
DR (SEQ ID NO:46);
- (14) MGVEHECPAWLWLLSLLSLPLGLPVLGAPPRLICDSRVLERYLLEAKEAENITTGCAEHCSLNE
NITVPDTKVNIFYAWKRMEVNXSXVEVWQGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKAV
SGLRSLTLLRALGAKKEAISPPDAASAAPLRTITADTFRKLFRVYSNFLRGKCLKLYTGEACRTG
DR (SEQ ID NO:47);
- (15) MGVEHECPAWLWLLSLLSLPLGLPVLGAPPRLICDSRVLERYLLEAKEAENITTGCAEHCSLNE
NITVPDTKVNIFYAWKRMEVNXTXVEVWQGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKA
VSGLRSLTLLRALGAQKEAISPPDAASAAPLRTITADTFRKLFRVYSNFLRGKCLKLYTGEACRT
GDR (SEQ ID NO:48); and
- (16) MGVEHECPAWLWLLSLLSLPLGLPVLGAPPRLICDSRVLERYLLEAKEAENITTGCAEHCSLNE
NITVPDTKVNIFYAWKRMEVNXTXVEVWQGLALLSEAVLRGQALLVNSSQPWEPLQLHVDKA

VSGLRSLTLLRALGAKKEAISPPDAASAAPLRTITADTFRKLFRVYSNFLRGKCLKLYTGEACRT
GDR (SEQ ID NO:49), wherein X is any amino acid except for proline.

36. A chimeric molecule comprising a CHEPO polypeptide of Claim 34 or 35 fused to a heterologous amino acid sequence.

37. The chimeric molecule of Claim 36, wherein said heterologous amino acid sequence is an epitope tag sequence.

38. The chimeric molecule of Claim 36, wherein said heterologous amino acid sequence is an immunoglobulin constant domain sequence.

39. The chimeric molecule of Claim 38, wherein said constant domain sequence is a Fc region of an immunoglobulin.

40. The chimeric molecule of claim 39 wherein said immunoglobulin is an IgG.

41. The chimeric molecule of claim 40 wherein said IgG is IgG1.

42. A method of stimulating the proliferation of cells expressing EPO receptor, said method comprising contacting said cells with an effective amount of a CHEPO polypeptide, wherein the proliferation of said cells is stimulated.

43. The method of Claim 42, wherein said CHEPO polypeptide is a CHEPO immunoadhesin.

44. The method of Claim 42, wherein said cells are of hematopoietic origin.